Rangeland Resources & Best Management Practices Review - Targhee NF

Allotment: Ripley Butte C&H Allotment **Forest/District:** Caribou-Targhee NF, Ashton-Island Park

Date: 9/2/2010

Reviewers: Liz Davy (District Ranger), Heidi Heyrend (Forest Range), Brad Higginson (Hydrology), Rose Lehman (Botany), John Lott (Soils), Lee Mabey (Fisheries), Robb Mickelsen (Forest Resources), and Kyle Moore (District Range)

Grazing System: Deferred Rotation on 3 Units: Tom's Creek, Eccles, and Ripley Units

Unit Reviewed: Tom's Creek **On Date(s):** 7/11/2010 **Off Date(s)** 8/21/2010
Numbers: 465 cow/calf pair

6TH Level Watershed: 170402020603 – Buffalo River **Stream Types Examined:** Toms Creek – C4/5

Geology: Outwash plains; Alluvium

Ecological Unit: 2040* - PICO Perfa – ABLA/CACA4, CACA4 Bootjack association (0-4% slopes). Moist outwash plains in the cool portion of the forested zone. Topography is nearly level to undulating stream terraces and overflow channels. The terraces have a seasonal water table and support reforesting clearcuts and closed canopy forests. The overflow channels have frequent, low intensity floods, a seasonal water table, and support riparian communities dominated by conifers, grasses and sedges.

Riparian Potential Natural Communities (PNC): PNCs within the allotment are willows (primarily diamondleaf, booth and Geyer's willow) dominated community types (c.t.) and extensive areas dominated by a diversity of sedges and wetland/riparian grass c.t.'s.

Present Vegetation: Sedge or mesic grass dominated c.t.'s with scattered willow plants.

Background: The Allotment is divided into three units with mixed ownership of State and National Forest System (NFS) lands. Sections of State Land are located along Tom's Creek and Blue Springs Creek. The Forest manages grazing on State land sections within the allotment under a Term Private Land Grazing Permit. As such the Forest has received the right to administer State lands for livestock grazing purposes for the term of the permit.

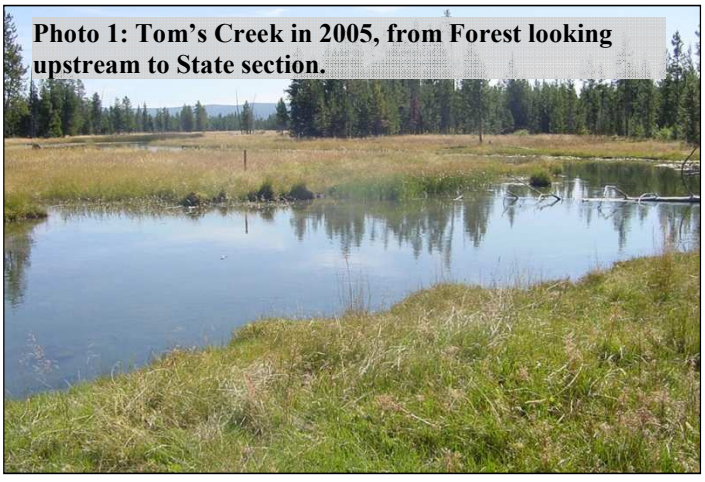

Photo 1: Tom's Creek in 2005, from Forest looking upstream to State section.

The Forest previously conducted a BMP review on this allotment in 2005 (Photo 1). As a result, the Forest installed a riparian designated monitoring area (DMA) on Tom's Creek just downstream of the State section (Section 36) on NFS land. The DMA was installed to monitor: 1) compliance with riparian grazing standards (annual indicators) and 2) long-term trend. An adaptive management approach was also adopted in the last NEPA decision for the allotment in 2007.

Tom's Creek Inventory: Earlier in the year (8/16/2010), a subgroup of the team (Heyrend, Higginson, Lehman, & Mabey) and Jennifer Chutz (District Wildlife Biologist), Jim De Rito (Henry's Fork Foundation) and Scott Gillilan (consultant) examined the entire length of Tom's Creek (spring source to the confluence with Buffalo River). The assessment included ungrazed reaches as well as portions within the Tom's Creek, Ripley Butte, and Buffalo Allotments. The team evaluated restoration opportunities and performed a proper functioning condition (PFC) inventory on the stream corridor. Possible PFC ratings include PFC, Functioning at Risk, and Non-functioning.

The nature of Tom's Creek is dynamic throughout its length (Gillilan 2010). From its source and through the upper portion of the Tom's Creek Allotment, the creek has a fine gravel bed (Photo 2). As the stream descends through the Tom's Creek Allotment and enters the Ripley Butte Allotment, stream conditions degrade. Specifically, the stream bed transitions to sand/silt dominated and the channel width/depth ratio increases (wider & shallower) with limited fish habitat and channel diversity. These conditions extend downstream through the Buffalo Allotment until the stream reaches an ungrazed reach near its confluence with the Buffalo River.

Photo 2. Tom's Creek in the State Unit of the Tom's Creek Allotment (photo 8/16/2010).

Photo 3. Tom's Creek in the Ripley Butte Allotment. Notice fine sediment bed and high width/depth ratio.

Stream conditions appear to be a function of grazing duration. Tom's Creek is in Proper Functioning Condition (PFC) within the State Unit of the Tom's Creek Allotment where livestock graze for 5 days. Tom's Creek is Functioning at Risk within the Lower Unit of the Tom's Creek Allotment where the grazing duration is 22 days. Tom's Creek is in poorer condition and rated as Functioning at Risk throughout the Ripley Butte Allotment where grazing duration is approximately 44 days. In addition to current grazing, there are several historical influences along Tom's Creek. An old breached earthen dam, the historic railroad grade, and historical grazing also play a part in the conditions found along the stream in the Ripley Butte Allotment.

Part of PFC is to provide habitat for fish, waterfowl, and overall biodiversity. Characteristics that provide for fisheries habitat do not exist due to the over-widened stream that limits sediment transport and fails to produce clean gravels necessary for biotic diversity (Photo 3). Willows along the stream, where present, are severely hedged and dwarfed. These willows provide no cover or structure (Photo 5). The stream in its present state is a C5 Rosgen stream type, which is rated as having a very high sensitivity to disturbance (Rosgen 1996).

Riparian Standards: The riparian proper use criteria listed in the Allotment Management Plan are:

- 4-inch Carex stubble height along the hydric greenline (streamside);
- 3 inch Carex stubble height in the riparian area (aquatic influence zone or AIZ);
- Riparian shrub use less than 30% current year's growth.

9/2/2010 Field Review: It was determined that a second riparian DMA was needed in a location that better reflects concerns along the stream. A second DMA was installed and measurements were collected at both sites. Additional rationale for the second DMA includes the following:

- The DMA established in 2005 borders the allotment boundary fence on river right (north bank).
- The streambank on river left (south bank) is typically very low, inundated, and not well defined. This makes it difficult to accurately monitoring bank alteration and greenline use by livestock.

- The DMA established in 2005 is not of the character that would respond fast to changes in management

The two DMAs are referred to as "upper" and "lower" given the relation to each other on the stream. The DMA established in 2005 is the "Upper DMA."

Upper DMA: Table 1 and Table 2 show the data collected at the Upper DMA in 2005 and 2010 (respectively). Some long term trend indicators are improving while others are static. The overall trend at this DMA appears to be slightly upward:

- Bank stability increased from 73% to 93%. Bank stability is now greater than desired condition of 80%. The new desired condition for this DMA will be to maintain at least 93% bank stability. It's important to note that the mean difference and range of differences between different observers 12.5% and 0-40% respectively (Burton et al. 2008).
- Covered banks increased from 94% to 100%.
- Willow abundance has remained static and far below desired levels at 1%.
- Greenline stability slightly increased to the desired condition of at least 7.0 from 6.4.
- The wetland site rating increased from good to very good.
- Greenline to greenline width and channel width-depth ratio remains static.

Table 1: Tom's Creek Upper DMA read on 11/3/2005 (post grazing)

Median Stubble Height (inches)	Mean Stubble Height (inches)	Bank Alteration (%)	Woody Use (%)	% Stable Bank	Covered Bank (%)	Percent saplings + young	Percent Mature	Percent dead	Percent hydric	Greenline stability rating
7.0	6.8	13%	63%	73%	94%	100%	0%	0%	100%	6.4
n=	80	80	3	80	80	2	0	0	80	80
95% conf	0.6	4%	24%	*	*	*	*	*	*	*
Criteria or RFP standard:										
> 4.0	> 4.0	< 20%	< 30%	> 80%	> 85%	> 25%	> 25%	< 10%	> 80%	> 7
Meets criteria? (yes or no)										
Yes	Yes	Yes	No	No	Yes	No: 2	No	Yes	Yes	No

	Ecological Status	Site Wetland Rating	Greenline-greenline width (ft)	% Woody	% Hydric Herbaceous	Dom. key species for Stubble Height	Ht of dom. key species
	69 (-20)	79%	51.6	0%	100%	CAAQ	6.4
Rating	Late	Good					
n=	80	80	80	80	80	31	*
95% conf	*	*	3.4	*		*	*

* Precision not calculated

Table 2: Tom's Creek Upper DMA read on 9/2/2010 (post grazing)

Median Stubble Height (inches)	Mean Stubble Height (inches)	Bank Alteration (%)	Woody Use (%)	% Stable Bank	Covered Bank (%)	Percent saplings + young	Percent Mature	Percent dead	Percent hydric	Greenline stability rating
5.0	5.1	14%	50%	93%	100`%	0%	100%	0%	84%	7.0
n=	80	80	2	80	80	0	1	0	80	80
95% conf	0.6	5%	*	*	*	*	*	*	*	0.4
> 4.0	> 4.0	< 20%	< 30%	> 80%	> 85%	> 25%	> 25%	< 10%	> 80%	> 7
Meets criteria? (yes or no)										
Yes	Yes	Yes	No	Yes	Yes	No	No: 1	Yes	Yes	Yes

	Ecological Status	Site Wetland Rating	Greenline-greenline width (ft)	% Woody	% Hydric Herbaceous	Dom. key species for Stubble Height	Ht of dom. key species
	71 (-20)	87%	52.9	1%	84%	CAUT	6.1
Rating	**Late**	**Very Good**					
n=	80	80	40	80	80	31	*
95% conf	*	*	5.1	*		*	*

* Precision not calculated

It is important to note that the permitees were operating under a 15% suspension during the 2005 season (running 400 head instead of the normal 465). The permitees have been running full numbers (465 head) since 2007. The lower head numbers in 2005 resulted in less carex use at the DMA (stubble height), but bank alteration and willow use remained about the same.

Three additional stubble height measurements were taken along Tom's Creek near the Upper DMA (Table 3). Two measurements were taken in the riparian area/aquatic influence zone (AIZ) and one was taken along the streambank/hydric greenline (HGL).

Table 3: Stubble height measurements on 9/2/2010 for the AIZ and HGL near the upper DMA.

	AIZ/Riparian	AIZ/Riparian	HGL/Streambank
Median Stubble Height (inches) =	**2**	**3**	**4**
Species =	DECA, CANE, Poa sp.	CANE, DECA	CANE, Carex sp.
Criteria =	≥ 3	≥ 3	≥ 4
Meets criteria? (yes or no)	No	Yes	Yes

Lower DMA: Table 4 lists the data collected at the Lower DMA on 9/2/2010. The annual use criteria of HGL stubble height was slightly exceeded (3.5 inches measured with criteria of 4 inches). Although not a current use criteria, bank alteration is slightly high at 27% (commonly used criteria for this stream type range from 10-20%). Most of the long term indicators are below desired conditions. Future monitoring will help determine the long-term trend at this site.

Table 4: Tom's Creek Lower DMA read on 9/2/2010 (post grazing)

Median Stubble Height (inches)	Mean Stubble Height (inches)	Bank Alteration (%)	Woody Use (%)	% Stable Bank	Covered Bank (%)	Percent saplings + young	Percent Mature	Percent dead	Percent hydric	Greenline stability rating
3.5	4.7	27%	no plants	61%	91%	0%	0%	0%	55%	5.5
n=	70	80	0	80	80	0	0	0	79	79
95% conf	0.8	7%	*	*	*	*	*	*	*	0.4
Criteria or RFP standard:										
> 4.00	> 4.00	< 20%	< 30%	> 80%	> 85%	> 25%	> 25%	< 10%	> 80%	> 7
Meets criteria? (yes or no)										
No	Yes	No	N/A	No	Yes	No	No	Yes	No	No

	Ecological Status	Site Wetland Rating	Greenline-greenline width (ft)	% Woody	% Hydric Herbaceous	Dom. key species for Stubble Height	Ht of dom. key species
	41 (-20)	74%	55.9	0%	55%	CANE	3.3
Rating	**Mid**	**Good**					
n=	79	79	80	79	79	45	*
95% conf	*	*	5.1	*		*	*

* Precision not calculated

Recommendations: The Forest completed NEPA for the allotment in 2007. A guideline of the Revised Forest Plan discussed in that NEPA is to "*Incorporate into AMPs, objectives for attainment of desired vegetation conditions for riparian plant community seral stage development and stream channel condition*." To be consistent with that guideline, the following riparian objectives should be applied to the Tom's Creek Unit:

- Lower Tom's Creek DMA Objectives:
  - Improve bank stability from 61% to 81% by 2015.
  - Retain 70% of annual growth on willows to achieve 5 ft willow height by 2019.
  - Improve the ecological status from mid-seral to late seral by 2018 and to PNC by 2021.
  - Decrease greenline-to-greenline width from 60-feet to 55-feet by 2015 and to 50-feet by 2020.
- Upper Tom's Creek DMA Objectives:
  - Maintain bank stability above 90%.
  - Retain 70% of annual growth on willows to achieve 5 ft willow height by 2019.
  - Improve the ecological status from late seral to PNC by 2015.
  - Decrease greenline-to-greenline width from 53-feet to 45-feet by 2015 and to 40-feet by 2020.

Adaptive Management Alternatives: Two adaptive management alternatives are presented below.

- Alternative 1: Improved riparian use standards are necessary to meet the above objectives. The riparian use criteria discussed in 2007 NEPA stated that those criteria could change if "*determined otherwise through interdisciplinary team process."* Although the current riparian use standards have produced an upward trend in bank stability at the Upper DMA, that location is not as suitable as the lower DMA for riparian grazing monitoring. Trend at the Lower DMA is unknown, but current conditions are well below desired levels. Therefore, the riparian use criteria shown in Table 5 will be applied starting in the 2011 grazing season. These riparian use standards are based on the Caribou Grazing Implementation Guide (GIG), the recent PFC assessment, and existing riparian use criteria. Implementation of these standards is expected to improve conditions along Tom's Creek.

  Consider providing offsite watering to better distribute cattle or additional fencing to protect highly sensitive streambanks.

Table 5: Recommended riparian use criteria based on the GIG.

Woody Species Utilization	Bank Alteration	Riparian SH (in) (E/M/L)	Comments and GIG Rationale
30%	10%	3/4/5	Functioning at Risk. Stream Group-08.

SH = Stubble height: The height of standing Carex species (measured in inches) within the riparian zone.
E/M/L = Early, mid, and late season grazing. The exact dates of "early", "mid", and "late" can vary between Forests or even years. Therefore, they are not specified. For the Targhee NF, "early" is usually defined as the beginning of the growing season to mid July; "mid" season from mid July to mid August; and "late" season from mid August to the end of the growing season.
Riparian vegetation: grasses and sedges (Carex) normally associated with wet or anaerobic soil conditions.
Upland vegetation: primarily grasses normally associated with dryer soil conditions (e.g. bluegrass & redtop).
Percent Utilization: The percent of total weight of key species within the riparian zone utilized by livestock while grazing the affected riparian area. Utilization standards apply to native and desirable nonnative key plant species as recorded at the end of the grazing period (when the livestock leave the unit/pasture).

  These riparian use criteria are expected to produce the upward trend stated in the objectives. It is very important to note that the upward trend will occur only if these criteria are consistently applied and met; some criteria were not met in 2010 (e.g. riparian stubble height & woody use at the Upper DMA and HGL stubble height at the Lower DMA).

- Alternative 2: The current riparian use standards have produced a slight upward trend in some indicators at the Upper DMA. Trend at the Lower DMA is unknown, but current conditions are below desired levels.

It is very important to note that the current riparian use criteria will produce a slight upward trend if they are consistently applied and met; some criteria were not met in 2010 (e.g. riparian stubble height & woody use at the Upper DMA and HGL stubble height at the Lower DMA).

Continue to apply the current riparian use criteria. Also continue to perform implementation (compliance) and effectiveness (trend) monitoring. If it is later determined that new riparian use standards are necessary to improve conditions at the Lower DMA, the Caribou Grazing Implementation Guide (GIG) should be used to set criteria. Table 5 shows the recommended riparian use criteria based on the GIG, the recent PFC assessment, and existing riparian use criteria. Implementation of these standards is expected to improve conditions along Tom's Creek.

Consider providing offsite watering to better distribute cattle or additional fencing to protect highly sensitive streambanks.

Blue Springs Creek: The 2005 BMP review also identified riparian concerns along Blue Springs Creek on State land. The above riparian use criteria (Table 5) should also be applied to Blue Springs Creek as it is functioning at risk and is in stream group-08. A riparian DMA should be established on Blue Springs Creek to evaluate implementation and effectiveness of riparian use criteria in moving Blue Springs Creek towards desired conditions.

References

Burton, T.A., S. Smith, and E. Cowley. 2008 Version 5. Monitoring Stream Channels and Riparian Vegetation-Multiple Indicators. Interagency Technical Bulletin BLM/USFS.

Gillilan, S.E. 2010. Preliminary Observations On and Restoration Options for Tom's, Fish, and Thurmond Spring Creek's, Island Park, ID. September 3, 2010.

Rosgen, D.R. 1996. Applied River Morphology. Wildland Hydrology. Pagosa Springs, Colorado.

Implementation Monitoring

1. Are grazing permit terms, conditions, and measures used to protect or improve riparian and aquatic resources? **Yes**

2. What are the grazing terms, conditions and measures that are intended to protect or improve riparian and aquatic resources?
   a. 4-inch Carex stubble height along the hydric greenline (streamside);
   b. 3 inch Carex stubble height in the riparian area (aquatic influence zone or AIZ);
   c. Riparian shrub use less than 30% current year's growth

3. What is/are the sources of those terms, conditions, and measures? **Bold** all that apply:
   a. AMP
   b. NEPA decision
   c. AOI
   d. Biological opinion
   e. Forest LRMP
   f. Other (specify):

4. Were range improvements prescribed to improve or protect aquatic and riparian resources implemented fully? **Not applicable, range improvements were not prescribed**

5. Do the annual operating instructions (AOI) include relevant triggers, requirements, or guidelines (e.g., LRMP, ESA biological opinion or concurrence, etc.)? **Yes**

6. Annual indicator monitoring

   Indicator #1: Median residual Carex stubble height on HGL
   a. Criteria = ≥ 4 inches
   b. Method used: Multiple Indicator Monitoring (Burton, Cowley, & Smith 2008) at DMAs. Also one other method in riparian area near Upper DMA
   c. Numeric objective? Yes
   d. Actual measurement: 5.0 & 4 inches at upper DMA; 3.5 inches at lower DMA
   e. Was the indicator met? Yes: 2 out of 3 measurements. No: 1 out of 3 measurements
   f. If not met, why was indicator not achieved? Use is higher at Lower DMA than Upper DMA. The Lower DMA was established to better address grazing concerns.

   Indicator #2: Median residual Carex stubble height in riparian area/AIZ
   a. Criteria = ≥ 3 inches
   b. Method used: Riparian area stubble height measurements
   c. Numeric objective? Yes
   d. Actual measurement: 3 inches near upper DMA and 2 inches near Upper DMA
   e. Was the indicator met? Yes: 1 out of 2 measurements. No: 1 out of 2 measurements
   f. If not met, why was indicator not achieved? Use varies across unit so two measurements were taken. Some areas were used beyond criteria.

Indicator #3: Riparian Woody Species Use

a. Method used: Standard ≤ 30%
b. Numeric objective? Yes
c. Actual measurement: 50% at Upper DMA
d. Indicator met? No
e. If not met, why was indicator not achieved? Willows are sparse along the creek. Where they do occur along the stream, use is heavy. Away from the stream, woody use is lighter than 30%

7. Have each of the grazing terms, conditions, and measures you listed for implementation question 2 been implemented fully?
   a. Grazing term/condition 2a **No**
   b. Grazing term/condition 2b **No**
   c. Grazing term/condition 2c **No**

8. Have desired condition measurable objectives for the protection of aquatic and riparian resources applicable to the allotment been developed? **Bold** one:
   a. Yes (go to question 9)
   b. No (end implementation questions)

9. What is/are the sources of the desired condition objectives? **Bold** all that apply:
   a. AMP
   b. NEPA decision: Hydrology Specialist Report
   c. AOI
   d. Biological opinion
   e. Forest LRMP
   f. Other (specify):

Effectiveness Monitoring

1. Long-term indicator monitoring

Indicator #1: Bank Stability

a. Criteria: ≥ 80%
b. Method used: Multiple Indicator Monitoring (Burton, Cowley, & Smith 2008) at DMAs
c. Numeric objective? Yes
d. Source of objective: Revised Forest Plan, NEPA decision
e. Actual measurement: 93% at Upper DMA and 61% at Lower DMA
f. Was the indicator met? Yes: 1 out of 2 locations. No: 1 out of 2 locations

Adaptive Management

1. Annual Indicators
   a. Were all annual indicators met? **No**
   b. If No, can actions be taken to correct or mitigate? **Yes**
   c. If No, why not? **N/A**

d. If yes, what changes in management should be taken? **See adaptive management recommendations on pages 4 & 5.**

2. Long-term Indicators
   a. Were all long-term indicators met? **No**

      If No, is the site progressing toward the objective(s)? **Yes at Upper DMA. Unknown at Lower DMA.**
   b. What information was used to determine the trend? **2005 and 2010 MIM data at Upper DMA.**
   c. If all long-term indicators were not met and the site is not progressing toward the objectives, is there a need to change either the annual indicator criteria (the criteria values and/or the indicator) or management?

      No, not at this point. Need to consistently meet existing riparian use criteria. Also see adaptive management recommendations on pages 4 & 5.
3. Do rangeland improvements appear to be assisting in moving the allotment toward-long term objectives? **N/A**